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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/725,939	11/30/2000	Robert J. Donaghey	BBNT-P02-10	8618

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EXAMINER	
MOORE JR, MICHAEL J	

ART UNIT	PAPER NUMBER
2666	

DATE MAILED: 12/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/725,939	DONAGHEY ET AL.	
	Examiner	Art Unit	
	Michael J. Moore, Jr.	2666	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 August 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) *20-23* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-23* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 November 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *9/2/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

   I. Claims **1-19**, drawn to assigning virtual circuit identifiers based on whether a link data rate satisfies a threshold data rate (class 370, subclass 397).

   II. Claims **20-23**, drawn to sorting a subset of nodes into an ordered list by link data rate and assigning virtual circuit identifiers to a portion of this list (class 370, subclass 395.52).

The inventions are distinct, each from the other because of the following reasons:

2. Inventions II and I are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention II has separate utility such as assigning virtual circuit identifiers to a data rate ordered list of a subset of nodes rather than assigning virtual circuit identifiers based on whether a link data rate satisfies a threshold data rate. See MPEP § 806.05(d).

3. Because these inventions are distinct for the reasons given above and the search required for Group II is not required for Group I, restriction for examination purposes as indicated is proper.

4. Newly submitted claims **20-23** are directed to an invention that is independent or distinct from the invention originally claimed for the reasons stated above.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims **20-23** are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Information Disclosure Statement

5. The information disclosure statement (IDS) submitted on 9/2/2004 was filed after the mailing date of the Non-Final Office Action on 4/7/2004. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the examiner has considered the information disclosure statement.

Specification

Amendments made to the abstract, specification, and claims in Applicant's amendment to obviate the objections in the previous Office Action are proper and have been entered. These objections have been withdrawn.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims **1-19** are rejected under 35 U.S.C. 102(e) as being anticipated by Kodialam et al. ("Kodialam") (U.S. 6,538,991). Kodialam teaches all of the limitations of the listed claims with the reasoning that follows.

Regarding claim **1**, "a method of assigning virtual circuit identifiers for routing data in a network comprising a plurality of nodes interconnected by links of different data rates" is anticipated by the label switched path (LSP) method shown in Figure 4. "Receiving link state information at a first node of the plurality of nodes, the link state information comprising link data rate information" is anticipated by the exchanging of information among routers regarding residual capacity of links (link data rate information) spoken of on column 6, lines 5-11. "Determining whether the link data rate information indicates if the links interconnecting the plurality of nodes satisfy a threshold data rate" is anticipated by the determination of whether the residual bandwidth of a link (residual capacity vector R) is greater than or equal to the bandwidth value of a requested demand (threshold data rate) spoken of on column 7, lines 29-40. Lastly, "assigning virtual circuit identifiers to nodes in the network based on whether the link data rate information indicates that the links satisfy the threshold data rate" is anticipated by the establishment of the label switched path (LSP) upon the successful completion of the test performed in Figure 4 and spoken of on column 7, line 51 – column 8, line 27.

Regarding claim **2**, "wherein the link state information received at the first node is received in packets flooded from at least one node of the plurality of nodes" is anticipated by the Open Shortest Path First (OSPF) protocol spoken of on column 1,

line 65 – column 2, line 10, which is used to exchange link state information between routers.

Regarding claim **3**, "identifying, from the link data rate information, fastest links of the links interconnecting the plurality of nodes" is anticipated by the identification of maxflow values $\alpha_{sd}\theta_{sd}$ for each ingress-egress point pair spoken of on column 7, lines 40-46. Lastly, "assigning virtual circuit identifiers to nodes in the network interconnected via the fastest links" is anticipated by the determining of a set of label switched paths (LSPs) that maximize the maxflow values for all the ingress-egress point pairs as spoken of on column 9, lines 40-51.

Regarding claim **4**, "a network device comprising at least one network interface configured to connect to at least one link, the at least on link being further connected to at least one node of a plurality of nodes in a network" is anticipated by router 500 shown in Figure 5 that connects to other routers through interfaces 503 and 504. A network device configured to "receive link state information comprising link data rate information" is anticipated by the exchanging of information among routers regarding residual capacity of links (link data rate information) spoken of on column 6, lines 5-11. "At least one processor configured to determine whether the link data rate information indicates if the links interconnecting the plurality of nodes satisfy a threshold data rate" is anticipated by router 500 of Figure 5 (processor) as well as the determination of whether the residual bandwidth of a link (residual capacity vector R) is greater than or equal to the bandwidth value of a requested demand (threshold data rate) spoken of on column 7, lines 29-40. Lastly, at least one processor configured to "assign virtual circuit

identifiers to nodes in the network based on whether the link data rate information indicates that the links satisfy the threshold data rate" is anticipated by router 500 of Figure 5 (processor) as well as the establishment of the label switched path (LSP) upon the successful completion of the test performed in Figure 4 and spoken of on column 7, line 51 – column 8, line 27.

Regarding claim **5**, "wherein the link state information is received in packets flooded from at least one node of the plurality of nodes" is anticipated by the Open Shortest Path First (OSPF) protocol spoken of on column 1, line 65 – column 2, line 10, which is used to exchange link state information between routers.

Regarding claim **6**, "wherein the at least one processor is further configured to identify, from the link data rate information, fastest links of the links interconnecting the plurality of nodes" is anticipated by router 500 of Figure 5 (processor) as well as the identification of maxflow values $\alpha_{sd}\theta_{sd}$ for each ingress-egress point pair spoken of on column 7, lines 40-46. Lastly, the at least one processor configured to "assign virtual circuit identifiers to nodes in the network interconnected via the fastest links" is anticipated by router 500 of Figure 5 (processor) as well as the determining of a set of label switched paths (LSPs) that maximize the maxflow values for all the ingress-egress point pairs as spoken of on column 9, lines 40-51.

Regarding claim **7**, "a computer readable medium containing instructions for controlling at least one processor to perform a method of assigning virtual circuit identifiers for routing data in a network comprising a plurality of nodes interconnected by links of different data rates" is anticipated by the router 500 containing memory 505

shown in Figure 5 as well as the label switched path (LSP) method shown in Figure 4 and also the computer readable storage medium statement on column 12, lines 14-50. "Obtaining link data rate information by a first node of the plurality of nodes" is anticipated by the exchanging of information among routers regarding residual capacity of links (link data rate information) spoken of on column 6, lines 5-11. "Determining whether the link data rate information indicates if the links interconnecting the plurality of nodes satisfy a threshold data rate" is anticipated by the determination of whether the residual bandwidth of a link (residual capacity vector R) is greater than or equal to the bandwidth value of a requested demand (threshold data rate) spoken of on column 7, lines 29-40. Lastly, "assigning virtual circuit identifiers to nodes in the network based on whether the link data rate information indicates that the links satisfy the threshold data rate" is anticipated by the establishment of the label switched path (LSP) upon the successful completion of the test performed in Figure 4 and spoken of on column 7, line 51 – column 8, line 27.

Regarding claim **8**, "wherein the data rate information obtained by the first node is received in packets flooded from at least one node of the plurality of nodes" is anticipated by the Open Shortest Path First (OSPF) protocol spoken of on column 1, line 65 – column 2, line 10, which is used to exchange link state information between routers.

Regarding claim **9**, "identifying, from the link data rate information, fastest links of the links interconnecting the plurality of nodes" is anticipated by the identification of maxflow values $\alpha_{sd}\theta_{sd}$ for each ingress-egress point pair spoken of on column 7, lines

40-46. Lastly, "assigning virtual circuit identifiers to nodes in the network interconnected via the fastest links" is anticipated by the determining of a set of label switched paths (LSPs) that maximize the maxflow values for all the ingress-egress point pairs as spoken of on column 9, lines 40-51.

Regarding claim **10**, "a method of routing data in an ad-hoc network comprising a plurality of nodes interconnected by links of different data rates" is anticipated by the label switched path (LSP) method shown in Figure 4. "Receiving link state information at a first node of the plurality of nodes, the link state information comprising link data rate information" is anticipated by the exchanging of information among routers regarding residual capacity of links (link data rate information) spoken of on column 6, lines 5-11. "Determining whether the link data rate information indicates if the links interconnecting the plurality of nodes satisfy a threshold data rate" is anticipated by the determination of whether the residual bandwidth of a link (residual capacity vector R) is greater than or equal to the bandwidth value of a requested demand (threshold data rate) spoken of on column 7, lines 29-40. "Assigning virtual circuit identifiers to nodes in the network based on whether the link data rate information indicates that the links satisfy the threshold data rate" as well as "routing data received at the first node using the assigned virtual circuit identifiers" is anticipated by the establishment of the label switched path (LSP) upon the successful completion of the test performed in the constraint-based routing method of Figure 4 and spoken of on column 7, line 51 – column 8, line 27.

Regarding claim **11**, "wherein the link state information received at the first node is received in packets flooded from at least one node of the plurality of nodes" is anticipated by the Open Shortest Path First (OSPF) protocol spoken of on column 1, line 65 – column 2, line 10, which is used to exchange link state information between routers.

Regarding claim **12**, "identifying, from the link data rate information, fastest links of the links interconnecting the plurality of nodes" is anticipated by the identification of maxflow values $\alpha_{sd}\theta_{sd}$ for each ingress-egress point pair spoken of on column 7, lines 40-46. "Assigning virtual circuit identifiers to nodes in the network interconnected via the fastest links" is anticipated by the determining of a set of label switched paths (LSPs) that maximize the maxflow values for all the ingress-egress point pairs as spoken of on column 9, lines 40-51. Lastly, "routing data received at the first node using the assigned virtual circuit identifiers" is anticipated by the establishment of the label switched path (LSP) upon the successful completion of the test performed in the constraint-based routing method of Figure 4 and spoken of on column 7, line 51 – column 8, line 27.

Regarding claim **13**, "a router comprising at least one network interface configured to connect to at least one link, the at least one link being further connected to at least one node of a plurality of nodes in a network" is anticipated by router 500 shown in Figure 5 that connects to other routers through interfaces 503 and 504. "At least one processor configured to receive link state information at the router, the link state information comprising link data rate information" is anticipated by router 500 of Figure 5

(processor) as well as the exchanging of information among routers regarding residual capacity of links (link data rate information) spoken of on column 6, lines 5-11. At least one processor configured to "determine whether the link data rate information indicates if the links interconnecting the plurality of nodes satisfy a threshold data rate" is anticipated by router 500 of Figure 5 (processor) as well as the determination of whether the residual bandwidth of a link (residual capacity vector R) is greater than or equal to the bandwidth value of a requested demand (threshold data rate) spoken of on column 7, lines 29-40. At least one processor configured to "assign virtual circuit identifiers to nodes in the network based on whether the link data rate information indicates that the links satisfy the threshold data rate" as well as to "route data received at the router using the assigned virtual circuit identifiers" is anticipated by router 500 of Figure 5 (processor) as well as the establishment of the label switched path (LSP) upon the successful completion of the test performed among routers in the constraint-based routing method Figure 4 and spoken of on column 7, line 51 – column 8, line 27.

Regarding claim **14**, "wherein the link state information is received in packets flooded from at least one node of the plurality of nodes" is anticipated by the Open Shortest Path First (OSPF) protocol spoken of on column 1, line 65 – column 2, line 10, which is used to exchange link state information between routers.

Regarding claim **15**, "wherein the at least one processor is further configured to identify, from the link data rate information, fastest links of the links interconnecting the plurality of nodes" is anticipated by router 500 of Figure 5 (processor) as well as the identification of maxflow values $\alpha_{sd}\theta_{sd}$ for each ingress-egress point pair spoken of on

column 7, lines 40-46. The at least one processor configured to "assign virtual circuit identifiers to nodes in the network interconnected via the fastest links" is anticipated by router 500 of Figure 5 (processor) as well as the determining of a set of label switched paths (LSPs) that maximize the maxflow values for all the ingress-egress point pairs as spoken of on column 9, lines 40-51. Lastly, at least one processor configured to "route data received at the router using the assigned virtual circuit identifiers" is anticipated by the establishment of the label switched path (LSP) upon the successful completion of the test performed in the constraint-based routing method of Figure 4 and spoken of on column 7, line 51 – column 8, line 27.

Regarding claim **16**, "a computer readable medium containing instructions for controlling at least one processor to perform a method of routing data in an ad-hoc network comprising a plurality of nodes interconnected by links of different data rates" is anticipated by the router 500 containing memory 505 shown in Figure 5 as well as the label switched path (LSP) method shown in Figure 4 and also the computer readable storage medium statement on column 12, lines 14-50. "Receiving link data rate information at a first node of the plurality of nodes" is anticipated by the exchanging of information among routers regarding residual capacity of links (link data rate information) spoken of on column 6, lines 5-11. "Determining whether the link data rate information indicates if the links interconnecting the plurality of nodes satisfy a threshold data rate" is anticipated by the determination of whether the residual bandwidth of a link (residual capacity vector R) is greater than or equal to the bandwidth value of a requested demand (threshold data rate) spoken of on column 7, lines 29-40. Lastly,

"assigning virtual circuit identifiers to nodes in the network based on whether the link data rate information indicates that the connected links satisfy the threshold data rate" as well as "routing data received at the first node using the assigned virtual circuit identifiers" is anticipated by the establishment of the label switched path (LSP) upon the successful completion of the test performed in the constraint-based routing method of Figure 4 and spoken of on column 7, line 51 – column 8, line 27.

Regarding claim **17**, "wherein the link data rate information received at the first node is received in packets flooded from at least one node of the plurality of nodes" is anticipated by the Open Shortest Path First (OSPF) protocol spoken of on column 1, line 65 – column 2, line 10, which is used to exchange link state information between routers.

Regarding claim **18**, "identifying, from the link data rate information, fastest links of the links interconnecting the plurality of nodes" is anticipated by the identification of maxflow values $\alpha_{sd}\theta_{sd}$ for each ingress-egress point pair spoken of on column 7, lines 40-46. "Assigning virtual circuit identifiers to nodes in the network interconnected via the fastest links" is anticipated by the determining of a set of label switched paths (LSPs) that maximize the maxflow values for all the ingress-egress point pairs as spoken of on column 9, lines 40-51. Lastly, "routing data received at the first node using the assigned virtual circuit identifiers" is anticipated by the establishment of the label switched path (LSP) upon the successful completion of the test performed in the constraint-based routing method of Figure 4 and spoken of on column 7, line 51 – column 8, line 27.

Regarding claim **19**, "a system for routing data in an ad-hoc network comprising a plurality of nodes interconnected by links of different data rates" is anticipated by the system shown in Figure 6. "Means for receiving link state information at a first node of the plurality of nodes, the link state information comprising link data rate information" is anticipated by the exchanging of information among routers (means) regarding residual capacity of links (link data rate information) spoken of on column 6, lines 5-11. "Means for determining whether the link data rate information indicates if the links interconnecting the plurality of nodes satisfy a threshold data rate" is anticipated by the determination of whether the residual bandwidth of a link (residual capacity vector R) is greater than or equal to the bandwidth value of a requested demand (threshold data rate) spoken of on column 7, lines 29-40. "Means for assigning virtual circuit identifiers to nodes in the network based on whether the link data rate information indicates that the links satisfy the threshold data rate" as well as "means for routing data received at the first node using the assigned virtual circuit identifiers" is anticipated by the establishment of the label switched path (LSP) upon the successful completion of the test performed among routers in the constraint-based routing method of Figure 4 and spoken of on column 7, line 51 – column 8, line 27.

Response to Arguments

8. Applicant's arguments with respect to claims **1-19** have been considered but are moot in view of the new ground(s) of rejection provided above.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kodialam et al. (U.S. 6,584,071), Ise et al. (U.S. 6,336,129), Stone (U.S. 6,757,286), Han (U.S. 6,351,465), and Fredette et al. (U.S. 2002/0110119) are all references that contain material pertinent to this application.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Moore, Jr. whose telephone number is (571) 272-3168. The examiner can normally be reached on Monday-Friday (8:30am - 5:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema S. Rao can be reached at (571) 272-3174. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

FRANK DUONG
PRIMARY EXAMINER

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